



PROJECT VALIDATION GUIDANCE CHECKLIST

Traditional DOE Construction Project

This validation checklist was established for traditional DOE construction projects to use for ER project modify on adjust as appropriate.

The objective project validation is to examine the planning, technical/cost/schedule baselines and project management to ensure that the project is ready to proceed and the baselines are consistent with programmatic needs, goals, and legal requirements. This also ensures the funds being requested for the project are commensurate with the scope and schedule being proposed.

General

- ___1. Where necessary, has agreement been reached between the program division, field office, and/or operating contractor on the facility operating (performance) requirements?
- ___2. Are facility requirements defined in terms of real property requirements, process definition, arrangement, system layout, operations, maintenance, utility supply, distribution, and cost?
- ___3a. Has DOE Order 6430.1A been used in developing the Conceptual Design Report (CDR)?
- ___3b. For areas not covered by DOE Order 6430.1A, what criteria are used?
- ___3c. Has the intention to conduct a DOE 6430.1A compliance analysis and review been expressed? (Required per DOE Order 5481.1B, Safety Analysis and Review System).
- ___4a. Have safeguards and security requirements been considered in the development of the CDR?
- ___4b. Have they been reviewed and accepted by safeguard and security personnel, and are they in accordance with the latest Master Safeguards and Security Agreement?
- ___5a. A site plan(s) of the project shall be forwarded for review by the validator. Is the project location predetermined by existing facilities or is site selection necessary?
- ___5b. What is the basis for the site selection and what alternatives were considered?
- ___5c. Is the project site shown on the current approved baseline plan from the Technical Site Information?
- ___5d. If not, has an Engineering Control Change to the baseline plan been completed, approved by the DOE Field Offices, and distributed to HQ?
- ___5e. If land acquisition is required, has the implementation of DOE Order 4300.1 been initiated?
- ___6a. Are function of structures, systems, and major components defined?
- ___6b. Have value engineering techniques been utilized to analyze these functions?
- ___7. Has the procurement strategy been coordinated with HQ Procurement Operation staff?
- ___8a. Have facility demands been matched with site utilities, roads, and support facilities?



- ___8b. Will utilities, roads, and/or support facilities require future upgrades/modification to match infrastructure demand?

Source: Environmental Project Manager's Handbook for Improved Project Definition, U. S. Department of Energy, February, 1995.



- ___9. Have requirements for initial complement of equipment been defined?
- ___10. Are quality levels and program requirements established?
- ___11. With present knowledge of the proposed facility, can emissions and wastes be treated or disposed of in compliance with Federal and State standards?
- ___12. Have state, local, or national codes and standards applicable to the work and operation of the facility been defined; can the facility operate within these codes and standards?
- ___13. Does facility provide office space for operating staff and does the amount of space conform to guidelines issued by General Services Administration?
- ___14a. Are space requirements in addition to current space available, or is it replacement for substandard space?
- ___14b. What is the disposition of the building/space being replaced, demolished, converted, etc.?
- ___15. Do projects meet the SEN-15-90, NEPA requirements, or have Environmental Assessment (EA), been prepared, as required by the Assistant Secretary for Environment, Safety and Health?
- ___16. Have the requirements been met for ensuring that new DOE facilities demonstrate new or emerging energy efficient technologies as presented in DOE notice 4330.0?
- ___17. Have Construction Project Data Sheets been submitted for "Operation Expense Funded" projects over \$1.5 Million and, in particular, those that are listed as Major System Acquisitions (replaced by Strategic Systems)?

Design (Conceptual, Title I, Title II)

- ___1. What is the status of the design? The engineering must be developed to the point of establishing initial scope, cost, and schedule baselined at CDR. The following should be included as part of the design documents:
 - ___ Site development plans including utilities
 - ___ Building layouts
 - ___ Major equipment arrangement
 - ___ Piping and instrumentation diagrams
 - ___ Piping and heating, ventilating, and airconditioning layouts
 - ___ Electrical single-line diagrams
 - ___ Major mechanical, electrical, and experimental equipment list with sizing and codes, standards, Quality Assurance (QA), and other principal special provisions
 - ___ Most reasonable utility supply option selected
 - ___ Utility requirements impacts; availability of outside sources; the most reasonable utility supply option selected
 - ___ DOE 6430.1A compliance analysis and review
- ___2a. Have there been any scope changes since the last validation?

Source: Environmental Project Manager's Handbook for Improved Project Definition, U. S. Department of Energy, February, 1995.



- __2b. If so, have rationale, costs and schedule impact been identified?
- __3. Are site conditions understood (e.g., legal encumbrances and restrictions, soil borings, water table, borrow and spoil areas, railroad bridges and road access, utility sources and routing restrictions, construction site layout and limitations)?
- __4. Have safety hazards and risks been determined and have appropriate safety evaluations been performed?
- __5. Has the design undergone a value engineering study, and if so, have design alternatives been incorporated which are life-cycle cost effective?
- __6a. Has an environmental assessment been performed?
- __6b. What is the status of environmental documentation?
- __7. Has Research and Development (R&D) prerequisite to facility design and construction been identified, scoped, scheduled, and funded?
- __8. Have all those who could influence the design participated in development/preparation and approval of the concept?
- __9a. What are major areas of uncertainty (e.g., R&D, design feasibility, schedule, etc.)?
- __9b. Has this been factored into the risk assessment to determine the contingency?
- __10. Has the Energy Conservation Report as required by DOE Order 6430.1A been prepared as a part of the design?
- __11. For applicable buildings, or building areas, does design meet Title 10, Code of Federal Regulation Part 435, Energy Conservation Voluntary Performance Standards for Commercial and Multi-Family High Rise Residential Buildings, mandatory for new Federal Buildings?
- __12. Have maintainability considerations been built into the design, and does the design contain a good maintainability checklist specifically oriented to the project? The maintainability concerns that should be addressed are:
 - __ a. Accessibility
 - __ b. Operator/user friendly
 - __ c. Documentation
 - __ d. Standardization/interchangeability
 - __ e. Flexibility
 - __ f. Desirable levels of quality

Source: Environmental Project Manager's Handbook for Improved Project Definition, U. S. Department of Energy, February, 1995.



Schedule

Have the following factors been considered in developing the schedule:

- ☐ Effects of weather and season
- ☐ Resource loading and leveling
- ☐ Milestone responsibilities (AE, program, project, contractor)
- ☐ Budget cycle timing
- ☐ Contractor selection durations
- ☐ Headquarters reviews and approvals (including NEPA and Safety)
- ☐ Prerequisite R&D schedule constraints
- ☐ Dependency upon timing and amount of operating funds
- ☐ Historical experience on design, procurement, construction, technical reviews, National Environmental Policy Act documentation etc.
- ☐ Development of environmental documentation
- ☐ Procurement lead times for equipment (particularly reflecting vendor quotes)
- ☐ Logical sequence of design, procurement, and construction
- ☐ Realistic obligation and costing rates
- ☐ Workplace space constraints
- ☐ Exposure constraints
- ☐ Operational Constraints
- ☐ Maintainability reviews and deliverables
- ☐ Milestone dictionary

Cost Estimate

Details provided should be consistent with complexity, scope, nature (first-of-a-kind vs. repetitive), and status of the design (conceptual, Title I/II, etc.). Cost estimates and summaries should be understandable and be provided in a single volume if possible. Computerized CS² reports are not acceptable. Provide assumptions, basis of the estimate and narrative as required to furnish complete explanations. For major technical projects, the following estimating practices are pertinent:

General

- ☐ 1a. When was estimate prepared?
- ☐ 1b. Are estimates provided in both base year and then year dollars?
- ☐ 2. Basis of estimate: vendor quotes, similar projects, engineering calculations, etc.
- ☐ 3. Are estimates traceable and supportable, where necessary, with vendor quotes?
- ☐ 4a. Do contingency and escalation reflect the guidance issued (Cost Estimating Guide for Application of Contingency, Note Contingency Guideline Implementation, Paragraph 5.b.)?
- ☐ 4b. Does contingency reflect level of confidence in scope of work, development features, pricing methodology and complexity of project?
- ☐ 4c. Does contingency analysis provide for varying degrees of certainty in the estimate?

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- __5a. What escalation rates are being used?
- __5b. What documentation or analysis was used to support these assumptions?
- __5c. Have they been included and applied in a logical and consistent manner?
- __5d. What changes in estimates have occurred as a result of changes in escalation assumptions used in previous estimates?
- __5e. Have program-related changes been identified and crosswalked (schedule, technical, scope, or economic condition)?
- __6a. Have there been independent reviews of the project estimate?
- __6b. When was the estimate updated?
- __6c. How was the estimate updated (i.e., trends “bottoms-up,” only changed work, etc.)?
- __6d. When was last “bottoms-up” estimate performed?
- __7. Where unique construction or fabrication practices are required, has pricing advice been obtained from experienced firms knowledgeable in the field?
- __8. Where attempts are made to use estimating guides based on conventional construction items, have they been properly interpreted with required geographic, quantity, and complexity adjustments?
- __9a. Are indirect costs, profit, fees, etc., included?
- __9b. Are reasonable rates used?
- __9c. Have these been audited?
- __10. In the case of Title I/II design estimate, were all the specification and drawings available for development of the cost estimate?
- __11. Are all required experimental components included in estimate?
- __12. Has a procurement strategy been developed, i.e., Government Furnished Equipment, Cost Sharing, Cost-Plus-Fixed-Fee, Cost-Plus-Award-Fee, etc., for contracts and major cost items?
- __13. Are materials and systems selections, especially as they concern maintainability, based on life-cycle costs rather than first costs identified?
- __14a. Have Total Estimated Cost and Total Project Cost definitions been properly applied?
- __14b. Do the estimates reflect proper financial management practices and procedures?

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Construction

- ___1. Were bulk material quantities, established by takeoffs from conceptual drawings, based on engineering estimates or factored from previous work?
- ___2. Are allowances for quantity growth needed or provided?
- ___3. Is bulk material pricing current and reflecting local conditions where appropriate?
- ___4a. Is labor estimated using local rates, including applicable fringe benefits, travel allowance, and reasonable crew or craft mix?
- ___4b. Was the availability of construction labor critical skill categories in the local labor market considered?
- ___5. Is pricing of equipment supported by current vendor quotes or recent actual experience?
- ___6. Have indirect construction costs been included for normal support, field engineering, temporary construction, mobilization, warehousing, etc.?
- ___7. Is labor productivity based on historical experience adjusted or appropriate for site or unusual facility features?
- ___8a. If labor availability would be a problem, have allowances been included for attracting adequate work force?
- ___8b. Have construction of classified projects been addressed relative to cleared work force?
- ___9. Does pricing reflect code, QA, scheduling, climatic, geographic, and other unique specification requirements?
- ___10. If unitized pricing has been applied, are the raw material and labor cost, equations and other backup data provided or available?
- ___11. Are operational cost estimates and basis for overhead cost included and explained?
- ___12. Has a transition plan from construction to operations been developed along with procedures for controlling costs?

Engineering and Management

- ___1. Do the Engineering, Design, and Inspection (ED&I) Costs follow the guidance, The Definition and Treatment of Engineering, Design, and Inspection Costs, August 23, 1985?
- ___2. Are contractor project management and engineering costs appropriately chargeable to the project included?
- ___3. Was ED&I built up by assessment of drawings, specifications, analysis, comparable experience, or a percentage of construction?

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- __4. Are Title III inspection, QA, and QC costs included for Architect/Engineer, operator and construction, as appropriate?
- __5a. Is the management system organized and planned reasonable and responsive to project/program needs?
- __5b. Is authority at the proper levels?
- __5c. Are there duplicative or overlapping responsibilities?
- __5d. Is a cost and schedule deviation evaluation system in place?
- __6a. Is an effective baseline change control system in place including board charters and responsibilities?
- __6b. Are project baselines change procedures and process defined and understood?

Finding and Cost Status

- __1a. What is the basis for the planned authorization, appropriation, and costing schedule?
- __1b. What alternatives were considered?
- __2. What are the other associated project costs? See Item 12 of Project Data Sheet for details desired.
- __3a. Is the proposed annual funding consistent with a realistic project schedule?
- __3b. Is it based on an evaluation of planned contract awards delivery lead times, and logical critical path activity sequencing?
- __4. Have alternatives been considered in the event of a Continuing Resolution or reduced funding? Impacts?
- __5. Are any of the fixed-price construction contracts in the project incrementally funded?
- __6. Has the funding by client or consultant agencies been identified?
- __7. Have any reductions in project funding or fundings requests resulted in the elimination or reduction of energy conservation or maintainability items?

Additional Specific Guidance for EM-40 Projects

The following is additional information relevant to the EM-40 validation process:

- __1. A team approach will be used for the validation of EM-40 projects. The team will usually consist of members from GC/EH/PR/CR and contractor technical support personnel.

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- ___2. Validation material should be provided in a concise fashion, preferably in a single bound volume to all of the members of the validation team. Voluminous computer automated cost and schedule control system output reports are not accepted alternatives to a fully documented cost estimate report, which logically and coherently states all assumptions, basis for the estimate, and explanatory narrative.
- ___3. One of the primary areas of emphasis during the project validation reviews shall be the requested funding for the project. The validation teams shall examine Current Fiscal Year (FY), budget year (FY+1), and requested year (FY+2) for the project. The team will pay particular attention to both Budget Authorization (BA), obligations and cost accrual cumulative funding and funding carry-over (both unobligated BA and uncosted obligations). All funding profiles shall address both TEC and Other Project Cost (OPC) to obtain the Total Project Cost.

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